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Access to Education and Income Inequality Nexus: Findings from a Cross-Sectional Survey

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I. INTRODUCTION

Education is one of the prerequisites for building human capital, an ingredient necessary for developing a nation. Education is highly significant in determining future income levels. An individual with more education consumed is more likely to generate a higher amount of income since that individual, through years of education and training, has been able to prove them fit. However, the question remains why certain individuals fail to avail themselves of education.

Due to the prevalence of poverty, individuals vary in terms of available opportunities at their hands. While higher education often means higher income, several variables determine access to education – such as cost of education, family's financial condition, family size, aspirant's gender, etc. Besides, in this country, the quality of one's education is determined by the type of school one attends. Also, the distance from the institutions poses constraints in how one receives education and reap its benefit in the future.

Historically, investing in education has always been celebrated across nations for building efficient human capital and eradicating the existing inequality. In the same line of thought, Bangladesh has also increased its education investment. However, over the years, GDP has boosted, but the quality of education

remains still questionable. Although the poverty rates in the past have dropped quite significantly, income inequality is still on the rise. This income inequality can be catalyzed and generated by several factors. Education is frequently mentioned as one of these factors. And education status is substantially impacted by the access opportunity to education which is assumed to be highly dependent on family wealth. Nexus between education and income are remarkably correlated because the educated are highly eligible to apply for a job in the formal sector, whether an uneducated could not apply in the formal sector. So, it is like a trap that education determines the income level, and income influences the amount of wealth, which has a direct impact on educational access.

II. THE RATIONALE FOR THE STUDY

Bangladesh has achieved exceptional growth in terms of GDP. But there is a controversy regarding this growth. Could this growth represent the original scenario of the livelihood of the lower-class people? Though the GDP has increased in the recent year, it is evident from the report of Household Expenditure and Income Survey report of 2019 that the Gini Coefficient of Bangladesh is 0.482, which indicates that Bangladesh is running through a critical situation in terms of inequality. As per the CPD 2018, the real income of the bottom 5% of households declined to TK 733 in 2016 from TK 1682 in 2010, but the real income of the top 5% has increased on the same period. So, it is evident that the top 5%'s newly increased income is represented in GDP growth, but the lowest 5%'s dropping income is not reflected in this increased GDP. The government should ensure that everyone benefits from economic growth. The government needs to ensure equitable growth, but from the report of CPD and HIES, it is evident that the increasing GDP is not inclusive. Abhijit Banarjee and Esther Duflo identified that inequality is increasing day by day in developing countries because of unequal opportunities of basic needs. One such basic need is access to education. As per the human capital theory, education has become a crucial variable in income distribution, and the success of education greatly depends on the access level of education. So, it is quite obvious that there is a relationship between unequal income and unequal access to education. Or, more aptly put, one catalyzes the other. Bangladesh recently enacted the Eighth Five-Year Development Plan, and

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inequality is seen as a major impediment to growth in all of these initiatives.

III. A BRIEF OVERVIEW ON PREVIOUS EMPIRICAL INVESTIGATIONS

Access to education depends on economic, demographic, and geographic variables. There are empirical shreds of evidence that education has a positive relationship with income generation.

Distance to school tends to be important for students across the income spectrum, but particularly for students from low-income households. According to a study by Frenette in Canada, about 27% of students from upper-income families attend university shortly after high school, which is roughly 1.5 times higher than students from middle-income families and roughly three times higher than students from lower-income families (Frenette, 2002).

According to Igboh, Emmanuel study there is a positive relationship between school distance and male and female students' academic achievement, and the findings also revealed a weak positive relationship between school distance and male students' school attendance, while the findings revealed a weak negative relationship between school distance and female students' school attendance in Nigeria. (Stanley et al., 2017).

The educational and social status of their parents has an impact on their children's educational experiences. Since educational persistence is linked to better job market results (Alcaraz, 2020).

The number of siblings which is related to family size has an important and negative effect on education, according to the regression equation of siblings on educational achievement but the results are constrained in that they only illustrate the indirect impact of the number of siblings on potential earnings through educational attainment. (Gede & Wisana, 2019).

Siblings' education has great implications on education attainment. The relationship with older siblings lowers the performance of children in low-income families in England, while it increases the performance of children in higher-income families. (Nicoletti & Rabe, 2019).

Agguire, Matta study showed that prior admission of their older siblings has a major impact on the college option of their younger siblings, according to this study (Aguirre et al., 2021). Older siblings' choice of education also influences financial assistance programs are inadequate to address an unfair allocation of postsecondary education's economic resources.

Need-based student financial assistance helps to improve equality of opportunities by expanding higher education enrollment, enabling students to choose from a wider variety of educational choices, and motivating students to stay in school longer. It can also minimize

the financial cost of college for low- and middle-income families (Hansen, 1983)

Coady and Dizioli's study findings highlight the critical role that education investments can play in reducing income inequality, especially the critical role that education expansion policies emphasize more equitable access to education. When dynamic panel estimation techniques are used, the positive relationship between education and income inequality becomes somewhat greater, statistically significant, and consistent across estimators. (Coady & Dizioli, 2017).

Rodríguez-pose and Tselio obtained that previous-period income inequality influence current-period income inequality (Rodríguez-pose & Tselios, 2008).

Mexican government rolled out Oportunidades (originally called PROGRESA), an innovative, wide-scale government cash transfer program that gives grants to low-income mothers to offset the real and opportunity costs of sending their children to school. Money is given to mothers instead of fathers in order to ensure that the money reaches their children. The popularity of this policy, as well as educational policies that make primary education compulsory, has resulted in nearly 100% primary school attendance in Mexico (Alcaraz, 2020).

In association with the fact that working parents earn more money and can easily replace parental time care by engaging in high-quality specialized childcare. Others consider the loss of parental time care to be a downside (Yang & Bansak, 2019).

Frenette's study only examined the probability of attending university shortly after high school graduation and focused on geographical location. The study was based on student who was about to graduate high school. The study did not focus on primary and secondary going students. This study is applicable for high-income countries with less population as it was studied in Canada. (Frenette, 2002). Also, the prevalence of student loans and higher returns in developed countries like Canada is also a crucial determinant of higher study which is not seen in the least developed countries.

According to Stanley's research, the distance was defined as short when distance is 1 or 2 K.M. and far when distance 3 or 5 K.M. If we study the relationship of education attainment and distance of educational institutes of different degrees of education the distance should be defined more vastly. (Stanley et al., 2017). In the Bangladeshi context mostly, academic performance is judged upon public exam result in primary and secondary and CGPA at tertiary level.

As stated in Alcaraz's study on the relationship between education and parents' status there was government cash transfers to parents especially mothers to mitigate the opportunity cost of sending their children to schools. This policy not yet been adopted in Bangladesh. However, we can study the effect of

government-based scholarship, given to meritorious student for their performance in public exams (Alcaraz, 2020).

Nicoletti and Rabe study was based only on the National curriculum, some countries might have a diverse curriculum. So, the effect of siblings on education attainment might vary in the least developing countries (Nicoletti & Rabe, 2019). Study of Coady and Dizilio the economic analysis with a human capital model which only contains income and years of schooling and disregarded the wealth effect on education (Coady & Dizioli, 2017). According to Gade and Wisana study in China has little shortcoming as China has adopted one-child policy in 1980, So the household is likely to have less no. of children and resulting in fewer siblings.

IV. THE OBJECTIVE OF THE STUDY

Broad Objectives: The main objective of this study is to investigate the relationship between inequality in access to education and income distribution.

The study aims to reveal the following –

- (i) To identify the causes that create inequality in accessing education.
- (ii) To reflect on the nexus between unequal access to education and income distribution.

V. DATA AND RESEARCH METHODS

The study follows both quantitative and qualitative. For the quantitative section, primary data have been collected through an in-person self-administered questionnaire-based field survey. Respondents answered 30 questions on their current income, education qualification, the geographical location of birth, family income, parents' education, etc. Human capital is largely dependent on the time allocation on education and also on the quality of educational institutions. So, for a better understanding of the existing unequal access to education, respondents were also asked about the location of their institutions and the distance from the residence. Access to education is highly dependent on the concurrent income of the family. So, we collect data of the present income of the individuals and the past income of their family during his studentship which is accounted long years ago. We have also collected data about the number of total brothers and sisters because a constant family income per capita expenditure on the education of a family is inversely related to the total number of brothers and sisters of the family. Geographical location has a great impact on access to educational institutions. So, respondents were also asked about their geographical location. Access to education is largely dependent on the availability of the study materials and also dependent on the availability of the family to bear the educational expenses. So, all the respondents are

asked about their type of school, whether that was a private school or NGO-based school, or Government school. There is a positive impact of the scholarship on access to education. So, the respondents are also asked about whether they received any scholarship or financial aid during their study life. The sample has been formed with 50 respondents; among them, 2 have been dropped due to not providing sufficient and coherent information for analysis. The survey respondents are current employees serving at the Bangladesh University of Professionals. Among the 48 respondents, 34 were male and 16 were female. For the quantitative section, descriptive statistical analysis was performed. Multivariable regression analysis and binary logistic regression techniques have been used to find the stated nexus. Partial and total correlation analyses have been run to detect the association among the variables. A necessary diagnostic test has been done for further assurance. MS Excel and STATA have been used for analysis. Though we avoid the impact of years of job experience on income there is an interview on the interview section to represent the impact of job experience besides educational qualification on income generation.

To understand the nexus between income inequality and education level, the study, and examination of enrollment rates in primary and secondary schools are very crucial. The secondary data of primary and secondary school enrollment has been used from the data bank of the World Bank.

For the qualitative analysis, three employees from BUP were interviewed upon conditional consent of not being willing to disclose their identity. Among them, one respondent answered partially in the interview-based survey.

a) *Limitation of the Survey*

Due to the pandemic situation and time shortage, the survey was confined in BUP. There were some difficulties while collecting data. First, there were some sensitive questions in the questionnaire such as family income, family wealth. Some respondents were unwilling to give information about their income and wealth. Second, the survey time was during office hours, so the respondents were busy, and some of them refused to fill up the questionnaire as they were involved in official duty. Thirdly, most of the respondents were asked to brief about the study that took a lot of time. Fourth, the faculties were very cooperative, and they were the majority who submitted the questionnaire most. It created biases in the study. Lower-level staff hesitated to fill up the questionnaire. Fifth, there were some administrative restrictions, and we could not collect data from the admin building. The respondents were from academic building. Finally, lack of incentive and absence of any reward for completing the questionnaire there were fewer respondents. We need

to drop some important variables due to missing response, partial response and outlier observations.

VI. RESULTS AND DISCUSSIONS

This section of the study reflects on the overall status of the respondents from different dimensions, such as condition of the current income, family wealth,

educational qualifications, etc. The lowest monthly income was 1000 BDT, and the highest was 130000 BDT. The average monthly income of the sample is 34,139 BDT. The following frequency distribution table gives a better idea regarding the monthly income of all respondents.

Table 1: Frequency distribution of income of the respondents

Income Range	Frequency	Cumulative Frequency	Relative Frequency	Percentage
1000-20000	7	7	0.145833	14.583
20000-39000	22	29	0.458333	45.833
39000-58000	16	45	0.333333	33.333
58000-77000	2	47	0.041667	4.167
77000-96000	0	47	0	0.000
96000-115000	0	47	0	0.000
115000-134000	1	48	0.020833	2.083
TOTAL	48	-	1	100

The table clearly shows that the largest number of respondents fall under the monthly income bracket of 20000 to less than 39000 BDT, which is 45%. However,

the second largest (33%) group concentrates under the 39000 to less than 58000 BDT. For better understanding, the following bar graph is helpful.

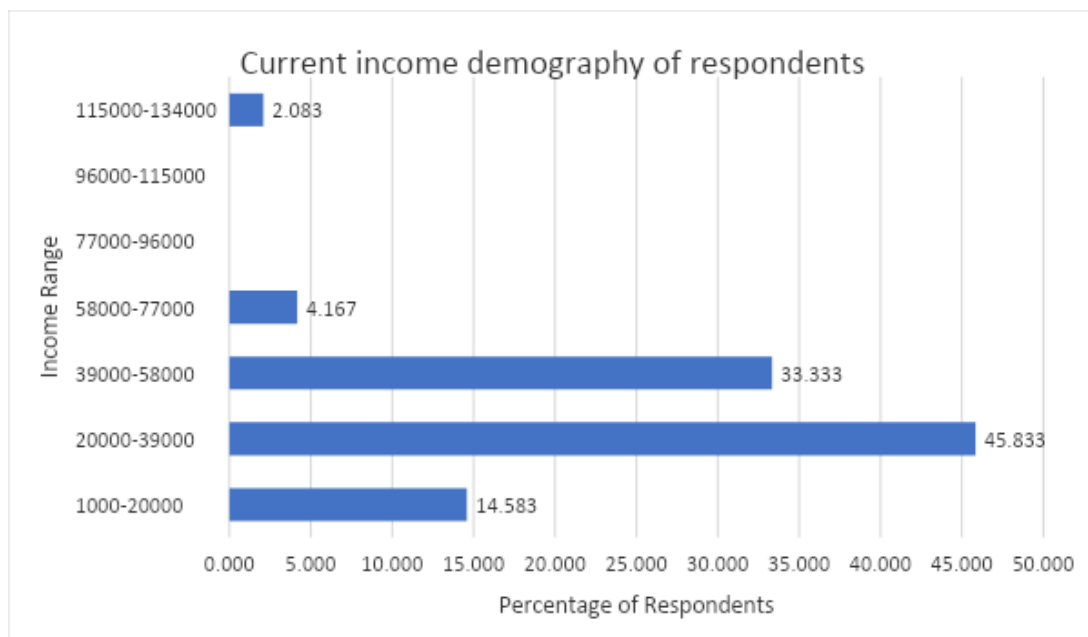


Figure 1: Current income demography of respondents

Educational Level of Respondents

Table 2: Educational level of the Respondents

Education Level	Frequency
Primary	1
SSC	9
HSC	5
Honor's	1
Master's	32

The survey sample shows that the majority of the respondents have completed a master's degrees. nine respondents have completed SSC only, while five have completed HSC.

The respondents were also asked about their expenditure on education while they were students. The

average expenditure on education of the sample is 3043 BDT per month and additional expenditure for buying stuff like pen, pencil, books and coaching etc. was 998 BDT per month. The following graph exhibits the additional expenditure in a better manner.

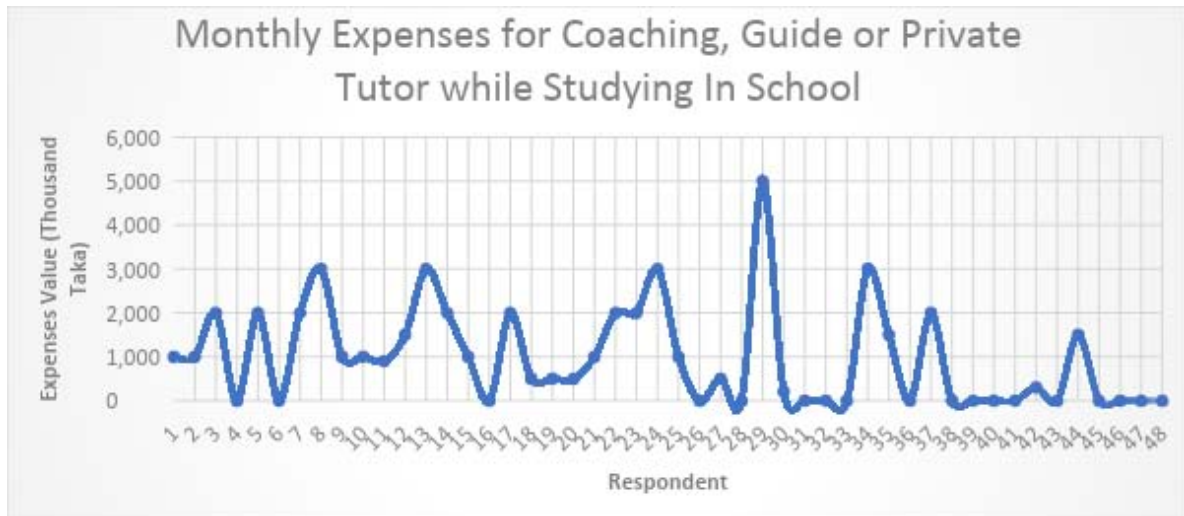


Figure 2: Monthly educational expenses of the respondents.

Name of Variable	Coefficient	Standard Error	P Value
Level of Education	3015	0.621	0.053
Family Income while Studying	1.730	0.543	0.041
Parents Education	2.967	0.432	0.052
Expenditure on Education	3.757	0.832	0.026
Family Size	-270	0.732	0.035
Financial Aid	0.527	0.243	0.061
Quota Facility	0.513	0.362	0.071
Location of School	-1253	0.034	0.031
Distance of School	-2365	2.134	0.041
Transportation	-1421	1.74	0.023

R Square = 0.73
Adjusted R Square = 0.71

Figure 4: Regression Result

In partial correlation analysis, it shows a positive association between the current monthly income of the respondents and the income of their respective families. The coefficient of correlation is 0.55. In the regression analysis it shows, all the other variables remain constant, if the family income increase by 1000 taka, the current income of the respondent is increased by, on average, around 1730 taka at 5% level of significance. Family income is also positively associated with the current wealth of the respondent (correlation coefficient 0.57). And the regression result shows that, if the family income increases by taka 1000, the current wealth of the respondent increased by taka 1796 on an average.

The current income of the respondents is also associated with the education level of the parents. Regression result shows a significant relationship between the respondent's current income and the education level of the parents. It shows that the current income of the respondents increases by around 2967 taka if the years schooling of the parents is increased by one year on an average, all the other variables remain constant.

Our study finds that respondents with higher expenditure on education have more current income. All the other variables remain constant, if the education expenditure of the respondents during their study life increase by taka 1000 per month, the current income of the respondents increases by taka 3757 per month. The impact of the expenditure on education is more on the

primary and secondary levels. If we add the gender dimension in the analysis, we can see that the average expenditure of education on female is 40% lesser than their male counterpart. Which is also reflected in their respective monthly current income. In our survey result, we can see that the income gap between male and females is about 53 percent.

Family size shows a significant role in defining the income distribution in the study. As the number of family members increases by one, the average current monthly income of the respondent decreases by taka 270 with 5% level of significance. Again, we see a positive association between the number of educated siblings and the current monthly income of the respondents.

In our analysis, we see that there is a significant role of financial aid on the income of the respondents. Respondents who have received any financial aid during their study life have more current income than others. The regression results show that the current income of the respondents increases by taka 527 if the financial aid received by the respondents amounts to 1000, all else equal.

And it is as expectedly, level of education significantly explained the current income of the individuals. As per the regression result, we can see that, as the years of schooling of the respondent increase by 1 year, the current monthly income of the respondent increases by taka 3015.

The study shows significant relationship between the current income of an individual and the distance between educational institutions from the home of that individual. Individual's current income declines when the distance of the school from home increases.

Respondents were asked about the type of school they studied based on the geographical location- metropolitan, urban, semi-urban, and rural. In our study, we see that the income of the individuals studied from metropolitan city are higher than the rural. We did not find any significant relationship between quota facilities and the current income of the respondent at 5% level of significance.

a) Interviews

The quantitative analysis shows that there are some variables that define the access to education have significant impact on the income of the individuals. Three distinct interviews reveal that there is a strong nexus between unequal access to education and income inequality.

Interview 1

Mr. Jahid (anonymous name) is an employee of BUP. He is now serving as a vehicle driver of BUP. His current income is around 30,000 BDT. He is the eldest son of his parents. He has 5 other brother and sisters along with him. His father was a farmer who operated on his land. At that time, their current income was treated

as a lower level of income. But after 1971, his father lost his ownership of land because they had to flee away to India during the war, and when they returned to Bangladesh, they found that they lost their ownership. As a result, their income level declined. And Mr. Jahid needed for dropping out of school. When asked about the reason to drop out, he answered that though he read in a government school free of cost, there were some other costs related to study, such as – the cost of buying the reading materials. He was more concerned about the opportunity cost of study rather than the direct cost. He invested his study hour in agriculture to help his father to generate more income to meet up their basic needs. He had not enough wealth in reserve to support them in times of crisis. As a result, he had to leave his study forcefully. Though he was intended to start studying after three years after his father's death, it had become impossible for him to attend school because he need to support his other 5 brothers and sisters to lead their basic life. Ultimately three of his brothers and sisters were unable to attend school more than secondary level because only till the secondary level the direct cost of the study is lower than compared to the higher level. Moreover, his two sisters got married because they thought that it will be better for them if their sisters get married early. After all, they thought that their sisters could lead a better life after marriage. So, as a result, their two sisters remained uneducated. As the job of higher-income requires higher educational background so none of them can apply for the top graded job. Ultimately, they could not participate any job of a higher level of income. Ultimately, he is confined with the low-income. He could not apply for a promotion because to get promotion he needs an HSC certificate, which does not belong to him. This is not the end of the story. As his income is not enough to support his family to lead a smooth life so his eldest son Jamal (anonymous name) could not attend formal education after college level because during 2011, Mr. Jahid faced a road accident and was unable to support his family financially so, forcefully, his eldest son needs to attend work to support his family. Ultimately his son also get trapped and was unable to achieve higher education, and ultimately, he could not apply for the jobs of higher income. So, his full family has got trapped in poverty which increases inequality.

Interview 2

Another respondent named Mr. Foysal (anonymous name) is operating as an employee in the admin block of BUP. He stated that his father was also a farmer. He is the 4th among his 7 brothers and sisters. Though his two elder brothers operate as farmers, his immediate elder brother is serving as a soldier in Bangladesh Army. So, basically, two of his elder brothers were not even class-8 graduates. But the other 5 brothers and sisters were educated. When asking

Mr. Foysal about the reason for not receiving further education of his two elder brothers, he replied that his younger two brothers supported all of their brothers and sisters financially. They did not have enough wealth to meet their basic needs. So, his two elder brothers served as the earning member of their family. So, it is clear that his two elder brothers could not attend school due to financial problems, and it is a matter of concern that the income of those two elder brothers decreases day by day. And they could not increase their income because they were not educated. Hence, agriculture was the only earning source of them and day by day, the fertility rate of their land was decreasing which led to the decreasing rate of their income. So, it is evident that income generation is greatly affected by the education level. And Mr. Foysal was able to get an education because he got enough support and access to the education which is ensured by his eldest two brothers. And now Mr. Foysal is operating as an admin officer and could apply for promotion policy because of his eligibility which is ensured by his education level. And as Mr. Foysal gets an opportunity to gather higher income. As a result, his youngest brothers and sisters are also engaged in higher education. It is expected by Mr. Foysal that all of them will be able to generate higher income and thus will be able to get out of the trap of poverty. As per Mr. Foysal, education level works as the major determinant of income generation. Because 20 years earlier, their total wealth was less than the present level, and as a result, their per head wealth was less than their need, but now it has increased, which could facilitate them to reduce their income inequality.

Interview 3

Mr. Fahim (anonymous name) is an employee of the BUP admin block. His father was a school teacher, and he is the eldest among his three brothers. The earning of his father was not enough to support their family to lead their daily life smoothly. His mother was suffering from Cancer. So, his father needed to spend extra money on the treatment of Mr. Fahim's mother. And after a few years, his mother passed away. Moreover, the death of his father during his college life affected their daily life badly. So, at a period, it was tough enough to continue his study, but fortunately for his result, he got a scholarship in class 5 and in class 8. As he was a meritorious student, so he used to earn his cost of study by doing tuition from the very beginning of his college life which help him to continue his study smoothly. He thought that without his earnings it was tough for him to continue his college because his father was not able enough to continue the cost of his study along with his mother's expenses. He concludes that he thinks that scholarship helped him to remove stress which help him to concentrate on his study properly and to achieve meritorious results which helped him to get the job with a handsome income.

Interview 4

Mr. Aziz (anonymous name) is an employee of BUP. He is operating as the in charge of his sector. His current income is stated around 39000 BDT. It is his own belief that his education qualification is not good enough to get this amount of salary, but he has experience of 18 years of doing a job in this sector. He has more practical knowledge about his job rather than theoretical knowledge which helps him to ensure a better level of income. He thinks that if he had better educational qualifications then could earn more, or he could earn this level of income at an earlier stage of his income life. That is, it is also evident that besides the education level, the years of job experience has an impact on the level of income generation.

From the interview of these three individuals, it can be concluded that the wealth or income level of a family has a huge impact on access to education. Individuals with better family conditions and higher family income can easily avail the opportunity of education. However, for cases as above, the poverty trap and other circumstances put constraints on individuals. As a matter of fact, an individual fails to utilize the access to education and drops out. This ultimately affects the future income of that individual since higher educational qualification necessarily translates into better paying jobs. Again, under such conditions, the future generation also becomes vulnerable.

b) Limitations of the Study

The maximum respondents are employed as faculty members and officers engaged in academic section, but the other stuffs and officers did not respond accordingly. As a result, the sample is biased and depicts only the scenario of employees of faculty members at BUP. Also, paucity of funding simply translated into failure in expanding the sample collection from other universities. Thirdly, due to COVID-19, it was impossible to collect the required data from the targeted universities. The paper also lacks data about the respondents' wealth. Respondents did not feel comfortable while answering about the amount of wealth during the data collection period. Moreover, most of the respondents have lack of idea about their family wealth during their studentship because it is hard to recall about the amount of total family wealth which was available around 10 or more years ago. Moreover, we have not collected data about their years of experience in job sector which could positively impact the level of income generation.

VII. CONCLUSION AND RECOMMENDATION

The paper reveals some important insights to the problem stated throughout the paper. It is very typical and coherent that income generation has a link with the education consumed. However, the

consumption of education solely depends on the various parameters that shape an individual's access to education. Therefore, consistent with the typical belief, access to education has an influence over the income generation of an individual, and also on income inequality as different persons have different levels of access to education.

From the discussion throughout the paper and interview insights, it is quite clear that both qualitative and quantitative findings of access to education having strong links with future income generation or income inequality holds good. This conclusion is further strengthened by the respondents' personal experience of financial backup, distance from schools, access to peripheral education, such as utilization of private coaching and affording of the notebooks. Individuals possessing the ability to afford such peripheral facilities are found to be generating higher incomes in future while those failing to afford these generate comparatively lower incomes. It cannot be disregarded that individuals vary in terms of access to education. Different persons have different experiences. An individual from an affluent family always differs in terms of choice making from someone who belongs to a lower-income family. Thus, the choice to avail education and the manner in which education has been consumed largely varies from person to person. This makes the entering portal to education life uneven for different people as they face different constraints. As a result, the future life is affected, and income inequality is created. Government and the policymakers should put more emphasis on reducing inequality in access to education to combat the on growing income inequality sustainably.

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